

### COURSE NAME

Name: **STRUCTURES TECHNOLOGY**

Code: 101135

Curriculum: **DEGREE IN CIVIL ENGINEERING**

Year: 2

Name of the module to which it belongs: COMMON MODULE FOR THE CIVIL BRANCH

Subject: STRUCTURES TECHNOLOGY

Nature: OBRIGATORY Duration: SECOND SEMESTER

ECTS Credits: 9

Classroom hours: 90

Face-to-face classroom percentage: 40%

Non-contact hours: 135

### FACULTY DETAILS

Name: AGRELA SAINZ, FRANCISCO (Coordinator)

Department: RURAL ENGINEERING

Area: CONSTRUCTION ENGINEERING

Location of the office: Ed. Leonardo Da Vinci, Campus Rabanales

E-Mail: ir1agsaf@uco.es

Phone number: 957212239

Name: LOPEZ MUÑOZ, ANTONIO CLEOFE

Department: RURAL ENGINEERING

Area: CONSTRUCTION ENGINEERING

Location of the office: Dpcho. Ing. Construcción - EPS de Belmez

E-Mail: aclopez@uco.es

Phone number: 957213025

Name: TAGUAS RUIZ, FRANCISCO JESUS

Department: RURAL ENGINEERING

Area: CONSTRUCTION ENGINEERING

Location of the office: Dpcho. Ing. Construcción - EPS de Belmez

E-Mail: p62taruf@uco.es

Phone number: 957213025

### SKILLS

- |      |   |
|------|---|
| CB1  | Have and understand specific knowledge of the study area of the Degree that gives skills for the exercise of the profession of Technical Civil Engineering.             |
| CB2  | Have and understand updated and cutting-edge knowledge related to the field of study of the degree of Technical Civil Engineering.                                      |
| CB3  | Be able to apply the knowledge acquired to their work or vocation in a professional manner. Prepare and defend arguments in the relevant knowledge area.                |
| CB7  | Possess the learning skills necessary to undertake studies with a high degree of autonomy.  |
| CU2  | Know and refine the user level of ITs.  |
| CEC6 | Knowledge of the fundamentals of reinforced concrete structures and metallic structures and the ability to conceive, design, build and maintain this type of structure. |

### OBJECTIVES

- Learn and properly carry out the calculation procedures for rigid and articulated jointed frame structures.
- Learn the methodology for calculating the external actions to consider in structural calculations according to the applicable regulations.
- Acquire basic knowledge of the phases involved in building an industrial warehouse: design types, structural material, laying out on the ground, structure, enclosures and other construction elements.
- Be able to apply the Technical Building Code and the EAE to calculate linear elements of both structural steel and reinforced concrete structures.

---

### CONTENTS:

#### 1. Theoretical contents

Block 1 - Introduction to structural calculations:  
Topic 1 - Introduction to the construction of building structures.  
Topic 2 - General methodology for calculating structures for sizing concrete and steel.  
Block 2 - Reinforced concrete.  
Topic 3 - Introduction to the technology of reinforced concrete  
Topic 4 - Technological properties of concrete  
Topic 5 - Technological properties of steel reinforcements.  
Unit 6 - Calculation bases for reinforced concrete structures  
Unit 7 - Calculation assumptions at the section level. Strain fields  
Unit 8 - Calculation of sections under simple bending  
Unit 9 - Calculation of sections under compound bending  
Topic 10: Buckling check.  
Unit 11: Calculation of transverse shear in reinforcements.  
Block 3 - Calculation of metallic structures  
Unit 12: Introduction to metallic structures.  
Unit 13: Technological and mechanical characteristics of structural steel.  
Topic 14: Structural safety and classification of sections  
Unit 15: Calculation of sections subjected to simple and combined forces.  
Unit 16: Calculation of elements. Limit state of instability  
Topic 17: Denting of the core and interaction of forces  
Topic 18. Bolted connections, welded connections and base supports

#### 2. Practical contents.

Eleven classroom exercises will be presented involving numerical problems related to structural calculations. A visit related to complex structures may be made.

- Steel.

- 1 - Classification of cross-sections.
- 2 - Traction and compression in steel elements, compression buckling.
- 3 - Simple and shear bending. Interaction between bending and shear.
- 4 - Calculation of the elastic critical moment by lateral buckling (simplified method).
- 5 - Compound bending. Calculation of bending-compressive and bending-tensile stresses in a beam.
- 6 - Calculation for a support under bending-compressive stress (cases 1 and 2).

- Concrete

- 1 - Tension and compression in concrete elements. Arrangement of reinforcements based on coatings and separations, as per EHE-08.
- 2 - Simple bending. Longitudinal reinforcement in a beam.
- 3 - Compound bending. Longitudinal reinforcement in a beam.
- 4 - Buckling in supports. Calculation for a longitudinal reinforcement in a support under bending-compressive stress.
- 5 - Shear. Transverse reinforcement in supports and beams.